

Date: Sun, 21 Nov 93 04:30:28 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #109
To: Ham-Homebrew

Ham-Homebrew Digest Sun, 21 Nov 93 Volume 93 : Issue 109

Today's Topics:

 10 Gig
 Lo-Fer, Med-Fer, Hi-Fer (have questions, need elmer)
 single sideband
 single sideband, phasing and T2/R2
 single sideband generation
 Xtal filter help.

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Thu, 18 Nov 1993 00:39:46 GMT
From: munnari.oz.au!spool.mu.edu!howland.reston.ans.net!gatech!udel!
news.intercon.com!psinnntp!uuneo!sugar!gclarkii@network.ucsd.edu
Subject: 10 Gig
To: ham-homebrew@ucsd.edu

Hi,From ham-homebrew-relay@ucsd.edu Sat Nov 20 22:43:56 1993
Received: from network.ucsd.edu by ucsd.edu; id WAA09215
sendmail 8.6.4/UCSD-2.2-sun via ESMTP
Sat, 20 Nov 1993 22:43:55 -0800 for <ham-homebrew-digest@ucsd.edu>
Received: from localhost by network.ucsd.edu (8.6.4/UCSDGENERIC.4)
id WAA17020 to ham-homebrew-digest@ucsd.edu; Sat, 20 Nov 1993 22:29:07 -0800
Received: from USENET by network.ucsd.edu with netnews
for ham-homebrew-digest@ucsd.edu (ham-homebrew@ucsd.edu);
contact usenet@network.ucsd.edu if you have questions.
To: ham-homebrew@ucsd.edu
Date: 17 Nov 1993 19:15:09 -0500

Message-ID: <2ceeqd\$01p@maxwell21.ee>
Organization: Michigan Technological University
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!news.moneng.mei.com!uwm.edu!
msuinfo!news.mtu.edu!news.mtu.edu!not-for-mail@network.ucsd.edu
Sender: ham-homebrew-relay@ucsd.edu

References <Nov15.155239.54713@yuma.ACNS.ColoState.EDU>,
<2cbvcd\$m8q@maxwell21.ee>, <2cc6b0\$cha@hpscit.sc.hp.com>
Subject : Re: single sideband, phasing and T2/R2

Richard Karlquist (rkarlqu@scd.hp.com) wrote:
: In article <2cbvcd\$m8q@maxwell21.ee>,
: Daniel E. Carlisle <decarlis@mtu.edu> wrote:
: >Galen Watts (galen@picea.CFNR.ColoState.EDU) wrote:

: >: (along with the companion R2) but I haven't built it, as I can't decide if
: >: I should put it on 440 SSB or 1750m CW/SSB. You must also have a 90 deg.
: >
: >: Galen, KF0YJ
: >

: >Why buy a phase shifter for RF?
: >...just use a 1/4 wave piece of transmission line after the power divider...
: >

: The 1/4 wave line gets kinda long on 1750m!
I meant for 440MHZ!
:wq

Date: 21 Nov 93 00:51:09 GMT
From: ogicse!uwm.edu!wupost!trineews.sbc.com!rvt@network.ucsd.edu
Subject: Lo-Fer, Med-Fer, Hi-Fer (have questions, need elmer)
To: ham-homebrew@ucsd.edu

In article <CGKH73.1u7@fms.com> andrews@fms.com (Andrew Sargent N80FS) writes:
>

>Hello all,
>

>Could somebody send me the tech info on the 'Fers' and the rules
>and reg's???

>
>Better yet, start a new thread...
>

A good start is to subscribe to "The Lowdown" which is a
publication of the Longwave Club of America. This is

usually a 30 or so page monthly publication listing current beacons on 160-190 kHz and in the MF or "Medfer" range around the broadcast band.

Subscriptions are \$18.00 and available from:

The Longwave Club of America
45 Wildflower Road
Levittown, PA 19057

Another source is "the low and medium frequency radio scrapbook" published by Ken Cornell, W2IMB.

Ken Cornell, W2IMB
225 Baltimore Ave.
Point Pleasant Beach, NJ 08742

(I know, yuck, New Jersey! I use to live near there...)

Cornell's book is about 100 pages of schematics and info on low and medium frequency operation.

I started listening on 160-190 kHz last winter and find reception of the 1 Watt beacons to be as difficult as weak signal vhf. It's a real challenge and a lot of fun.

I built a 10 MHz local oscillator driving a ZAD-6 Mini-Circuits DBM to use my old FT-101B on 10 MHz as the basic receiver. The antenna I've had most success with is a 4 foot diagonal 50 turn loop with a coupling loop matched to 50 ohms at 185 kHz. I used a bipolar low-Z amp between the antenna and rf port on the mixer. In the basement, I've heard a beacon in Indiana, about 200 miles away in good conditions.

I had little success with active antennas at frequencies above 100 kHz, but they worked fine at 60 kHz and lower. Random long wire antennas have never worked for me.

--

Roger V. Thompson, P.E.
Southwestern Bell Technology Resources, Inc.
550 Maryville Centre Dr.
St. Louis, MO 63141

|ARS AD5T
|314-529-7847 (Office)
|314-529-7674 (Fax)
|rvt@calvin.sbc.com

Date: Wed, 17 Nov 1993 21:54:51 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!
vixen.cso.uiuc.edu!sdd.hp.com!col.hp.com!srigenprp!alanb@network.ucsd.edu
Subject: single sideband
To: ham-homebrew@ucsd.edu

Albert T Davis (atd@cs.rit.edu) wrote:

: I have been out of this for a while....

: Is the filter method still the most common for SSB generation?
: Why?

: It seems to me that the phasing method is far superior with today's technology.

The phasing method works fine for transmitting, but does not have good enough unwanted-sideband rejection for receiving. Since mosts radios these days are transceivers, and you need the crystal filter anyway for receiving, you might as well use it for transmitting as well.

AL N1AL

Date: Wed, 17 Nov 1993 21:57:12 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!
vixen.cso.uiuc.edu!sdd.hp.com!col.hp.com!srigenprp!alanb@network.ucsd.edu
Subject: single sideband, phasing and T2/R2
To: ham-homebrew@ucsd.edu

Richard Karlquist (rkarlqu@scd.hp.com) wrote:

: >Why buy a phase shifter for RF?
: >...just use a 1/4 wave piece of transmission line after the power divider...
: >

: The 1/4 wave line gets kinda long on 1750m!

Also the 1/4 wave line only works on one narrow range of frequencies.

AL N1AL

Date: 20 Nov 93 17:48:43 GMT
From: ogicse!emory!kd4nc!ke4zv!gary@network.ucsd.edu
Subject: single sideband generation
To: ham-homebrew@ucsd.edu

In article <CGr8My.8n2@srgenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:

>Mark 'Rain Man' Dennehy (mdennehy@unix2.tcd.ie) wrote:

>: Newbie Question Time :

>: Why bother to eliminate the offending sideband in the

>: transmitter at all ?

>

>DSB suppressed carrier is a perfectly viable method that is indeed

>compatible with SSB receivers. There are two main problems:

>

>1) It requires twice the average power and 4 times the peak power to

>get the same power in a sideband. Since most PA stages are peak-power

>limited, you effectively lose 6 dB (4x) when received on an SSB receiver.

>

>2) It takes up twice the bandwidth, causing unnecessary interference.

>

>Both of the above reasons become less important if you are running QRP

>(low power). Also, QRP rigs tend to be smaller and simpler, so the

>relative simplicity of a DSB rig may be the deciding factor.

All very true. However, if you're willing to complicate the receiver, you can use synchronous detection. This recovers the signal that would otherwise be discarded by using SSB reception. And, it can be setup to reject non-correlated signals in one of the sideband bandpasses, IE you get correlation gain for the DSB components, but not for interference and noise which aren't correlated in the two channels. You have to use a fairly fancy common mode correlator circuit to do this.

Gary

--

Gary Coffman KE4ZV	Where my job's going,	gatech!wa4mei!ke4zv!gary
Destructive Testing Systems	I don't know. It might	uunet!rsiatl!ke4zv!gary
534 Shannon Way	wind up in Mexico.	emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244	-NAFTA Blues	

Date: Wed, 17 Nov 1993 21:51:30 GMT

From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!

vixen.cso.uiuc.edu!sdd.hp.com!col.hp.com!srgenprp!alanb@network.ucsd.edu

Subject: Xtal filter help.

To: ham-homebrew@ucsd.edu

John Welch (jjw@seastar.org) wrote:

: I've been working on a home-built xtal filter, and have got it

: working. However, I'm trying to figure out how to match its input &

: output to the other stages.

: I have made a simple bridge circuit, and it appears that the
: resonant impedance is about 150 ohms. Is this the impedance I need to
: match to? If not, how do I find the right impedance?

The desired load impedance is the one that gives the least passband ripple and insertion loss. With a 50-ohm source (signal generator) and 50 ohm load (receiver, scope, network analyzer, etc) solder a potentiometer (say, 500 ohms) between source and filter and filter and load. Adjust the pots (always the same resistance for each) for a nice filter "shape."

AL N1AL

Date: 20 Nov 93 23:23:04 GMT
From: ogicse!uwm.edu!cs.utexas.edu!sdd.hp.com!hpscit.sc.hp.com!
rkarlqu@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <mdennehy.753716904@unix2.tcd.ie>, <CGr8My.8n2@srngenprp.sr.hp.com>,
<1993Nov20.174843.13453@ke4zv.atl.ga.us>
Subject : Re: single sideband generation

In article <1993Nov20.174843.13453@ke4zv.atl.ga.us>,
Gary Coffman <gary@ke4zv.atl.ga.us> wrote:

>>relative simplicity of a DSB rig may be the deciding factor.
>

>All very true. However, if you're willing to complicate the receiver,
>you can use synchronous detection. This recovers the signal that would
>otherwise be discarded by using SSB reception. And, it can be setup to
>reject non-correlated signals in one of the sideband bandpasses, IE you
>get correlation gain for the DSB components, but not for interference
>and noise which aren't correlated in the two channels. You have to use
>a fairly fancy common mode correlator circuit to do this.

DSB reception of DSB signals utilizing both sidebands is just as power efficient as SSB reception of SSB signals on an *average power* basis. However, the PEP to average ratio is 4 to 1 for DSB and only 2 to 1 for SSB (as pointed out earlier by Alan Bloom). Since both the FCC and transmitter technology tend to be peak power limited rather than average, DSB effectively has a 3 dB. disadvantage even if you receive both sidebands coherently.

The non-correlation of interference is only worth 3 dB.

And of course none of this works unless you transmit a pilot carrier or pilot tone to get exact carrier recovery, as you pointed out. For continuous signals like video and data, you can get around that by the usual frequency doubler carrier recovery trick.

Rick Karlquist N6RK
rkarlqu@scd.hp.com

Date: 20 Nov 93 18:00:28 GMT
From: ogicse!emory!kd4nc!ke4zv!gary@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <mdennehy.753716904@unix2.tcd.ie>, <CGr8My.8n2@srgenprp.sr.hp.com>, <2cja8o\$ffc@usenet.INS.CWRU.Edu>
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: single sideband generation

In article <2cja8o\$ffc@usenet.INS.CWRU.Edu> trier@slc6.ins.cwru.edu (Stephen C. Trier) writes:

>
>My understanding (from book larnin', not experience) is that there's an
>additional problem: DSBSC didn't work well with direct-conversion SSB
>receivers. Apparently that it is hard to tune the receiver because it
>will pick up both sidebands. Unless tuned very precisely, the two
>signals will tend to interfere and cause hard-to-understand output.
>
>Is this correct? How much of a problem is it in reality?

It's a problem. It's worse than receiving AM with a SSB receiver. With no carrier to zero beat as a tuning aid, and with both sidebands present in the recovered audio, if your tuning is only slightly off, the two sidebands will have different phases and interfere in strange ways. If the tuning is further off, you hear two copies of the audio shifted in pitch from each other.

Gary

--
Gary Coffman KE4ZV | Where my job's going, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | I don't know. It might | uunet!rsiatl!ke4zv!gary
534 Shannon Way | wind up in Mexico. | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -NAFTA Blues |

End of Ham-Homebrew Digest V93 #109

